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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

MOVVA, AMAR

ART UNIT

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MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/651,889	Applicant(s) KAWASAKI ET AL.	
	Examiner AMAR MOVVA	Art Unit 2894	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 21-45 is/are pending in the application.
- 4a) Of the above claim(s) 3-9, 13, 14, 23, 24, 27, 28, 33, 39, 42 and 43 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 10-12, 15-17, 21, 22, 25, 26, 29-32, 35-38, 40, 41, 44 and 45 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 11-12, 15-16, 21-22, 25-26, 29-32, 35-38, 40-41 and 44-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takafuji '578 in view of Takenaka '676.

a. Regarding claims 1 and 11-16, Takafuji discloses in figure 3, a TFT formed over a substrate (1, fig. 1-3); an active layer (4, fig. 1-3) formed in the TFT; and a first and second region (5,6, fig. 1-3) and a third region (2/7, fig. 1-3) formed in the active layer, the third region being formed between the first region and the second region, wherein the third region has a first and second width (fig. 3) wherein the third region includes a channel forming region, wherein a first and second width of the third region is narrower than a width of the first region and a width of the second region (fig. 1-3), wherein each of the first and second width of the third region, the width of the first region and the width of the second region is a length in a direction perpendicular to a carrier flow direction, i.e., from source to drain (fig. 1-3), and wherein a portion of the third region is concave convexed in the direction perpendicular to the carrier flow direction in the (fig. 1-3).

Takafuji, however, does not expressly disclose that the first width is narrower

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than the second width nor does it disclose a zero grain boundary in the channel forming region.

b. Takafuji in another embodiment (fig. 9c) discloses a labyrinth-like snaking channel region (the third region) of varying widths perpendicular to the carrier flow (a first width being the narrower than a second width).

c. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used Takafuji's labyrinth-like snaking channel region of embodiment fig. 9 (c) in the embodiment of fig. 1-3 in order to make for a larger channel length thereby reducing short channel effects while not consuming a larger device length.

d. Takenaka discloses that the grain boundary in the channel region of a transistor is limited to zero (col. 1 discloses that the channel silicon film can be a monocrystal).

e. It would have been obvious to one of ordinary skill in the art at the time of the invention to limit the grain boundary of the channel region to zero in order to avoid undesired transistor behavior that results from the presence of grain boundaries in the channel region (e.g. a slower device).

f. Regarding claims 21-24 and 37-45, Takafuji discloses the limitations above and noting that the above mentioned definition of the first region can be alternatively be the definition of the second region, and vice versa, either of those regions could be either the source, or drain, while the other region would be the drain, or source, accordingly.

3. Claims 10 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Takafuji/Takaneka in view of the Nakayama '338.

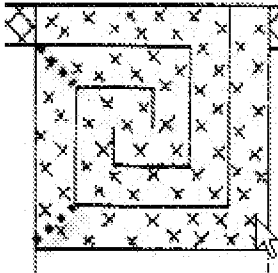
a. Takafuji discloses the device of claims 1, 11-16, 21-24 and 37-45 but does not expressly disclose the thin film transistor is incorporated in to electronic devices such as camera.

b. Nakayama discloses thin film transistor used in digital camera and personal computer (see the second paragraph below the abstract).

c. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the thin film transistor in the devices such as cameras so those devices have electronic components with improved characteristics.

Response to Arguments

1. Applicant's arguments have been fully considered but they are not persuasive.
 - a. Applicant argues that the second width is not part of the convex portion of the channel. Examiner notes that the second widths (indicated by the dotted lines) are part of a convex portion that has carrier flow perpendicular to the convexity.



- b. Applicant argues that first region, second region, or a third region cannot be construed as regions 5, 6, and 2 respectively. As a preliminary matter examiner notes that regions 5 and 6 (corresponding to the first and second region) are not both sources rather one acts as a source while the other acts a drain which , it this combo which may be interchanged. Regarding element 2 (corresponding to the third region) this merely to conveniently point out the region in between regions 5 and 6. If applicant prefers this may be referred to as element 7 instead, it does not refer to gate electrode. In any case the gate electrode inherently is over the region comprising the channel.

Conclusion

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AMAR MOVVA whose telephone number is (571)272-9009. The examiner can normally be reached on 7:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Nguyen can be reached on 571-272-2402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Amar Movva
Examiner
Art Unit 2894

Am

/Bradley K Smith/
Primary Examiner, Art Unit 2894